

Teaching During a Pandemic

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Since the first confirmed case in January 2020,¹ the novel coronavirus (COVID-19) pandemic has overwhelmed health care systems in many parts of the United States and fundamentally altered graduate medical education (GME). Washington State became the initial epicenter for this transformation after an outbreak at a long-term acute care facility in February. In Seattle, we have had an early vantage point of changes in GME that are now occurring nationally: medical student clinical rotations have been uniformly suspended, residency programs are modifying or decreasing core teaching sessions to prevent further virus transmission, and many departments have replaced grand rounds with COVID-19-specific town hall meetings.²

There is historical precedent for this current disruption to medical education. In early 2003, severe acute respiratory syndrome-associated coronavirus (SARS-CoV) spread throughout Ontario, Canada, and numerous countries in Asia, forcing educators to abandon in-person curricula.³ Just weeks after the Canadian index case, the University of Toronto suspended its undergraduate courses and canceled all medical student clinical rotations, while many outpatient residency rotations were truncated or halted.^{4,5} As illness spread, university faculty were pulled from nonessential activities in favor of leadership and clinical duties. As in our current crisis, providers faced not only immense clinical challenges but also the upheaval of traditional teaching activities.

Undoubtedly, the barriers to medical education during an infectious crisis are numerous: high clinical volume, information overload, faculty or trainee illnesses, and psychological burden incurred during a stressful time. Nevertheless, it is our duty to educate, perhaps even more so during a time of crisis. How can we adapt our educational practices to the constraints imposed by a pandemic? We offer several strategies gleaned from our experiences at the forefront of the COVID-19 outbreak in the United States and, importantly, believe that medical education can be a solace rather than a distraction.

Adapt to a Virtual Classroom

As social distancing has become imperative, we have adapted our teaching methods and replaced previously scheduled conferences with virtual curricula. We now conduct morning report via virtual classroom and invite expert speakers to join by video conference. When our weekly clinicopathologic conference was discontinued, we replaced it with a new teaching series titled “Virtual Interactive Case-Based Education.” We intentionally chose platforms with screen sharing and virtual breakout group capability (eg, Zoom) and incorporated text-based audience response to maximize learner engagement and promote camaraderie. The adoption of virtual conferences has broadened the reach of our curricula: resident physicians in our 3-hospital system can attend local didactics and system-wide conferences, increasing trainee exposure to educational opportunities.

Today’s learners expect educators to effectively use information technologies in the classroom.⁶ Constructivist learning theory, which emphasizes the experience of the learner rather than the transmission of information from the instructor, can guide our efforts to optimize the virtual learning environment.⁷ We recommend the following practices when adopting a virtual approach to classroom-based learning:

- **Practice:** Conduct a practice session beforehand to familiarize yourself with the virtual classroom and uncover inevitable glitches or errors. We recommend conducting this session as faculty-only with live chat enabled to obtain real-time feedback from fellow educators.
- **Set expectations:** Make expectations clear at the beginning of each session to prevent miscommunication and confusion. For example, describe the virtual learning tools that you will use during the session, clarify whether the session will be interactive, and explicitly state whether verbal or typed communication via chat box is preferred.
- **Engage learners:** Delivering a slide-based lecture via live video conference is no different than having trainees watch a recorded didactic. Moreover, a learner with a muted microphone and camera turned off is likely to succumb to

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distraction. We strive to integrate constructivist teaching techniques grounded in social learning theory when possible in order to maintain a collaborative and interactive classroom. Thus, we recommend enabling cameras and using virtual small group breakouts, screen sharing, or virtual chalkboards to mimic the active learning environment of an in-person classroom.

- **Solicit feedback:** It may be difficult to gauge the experience of multiple learners, especially in larger teaching sessions. Early and frequent feedback facilitates iterative improvement of the structure, content, and delivery of virtual conferences. We reserve 5 minutes for feedback at the end of each session and implement suggestions into our next lesson plan.

Embrace Informal Teaching

Don't prioritize formal teaching if you are overwhelmed by clinical activities—experiential teaching can be an effective way to accomplish unique learning objectives, and experiential learning is an important component of GME.⁸ During pandemics, trainees learn through first-hand observation of illness and by watching mentors navigate the challenges of an outbreak. As you work, allow your trainees to experience the flow of a crisis and be transparent with your thought processes. During a teaching conference at our hospital, for instance, the homeless clinic director included residents in a COVID-19 national conference call. Following the call, he facilitated a discussion with residents focusing on the pandemic's effect on the homeless population.

Incorporate Pandemic Updates

Email overload quickly becomes problematic during a pandemic. Regularly scheduled verbal updates are an easy, important, and humanistic adjunct to electronic communication and can be accomplished via a virtual classroom. At the onset of the pandemic, our chief resident provided a COVID-19 summary at morning report and, thereafter, a 5-minute daily update. If done virtually, this provides a safety net for residents—those who are unable to keep pace with email can simply log into morning report to hear the daily update. This also provides a venue for trainees to remain informed about university- or hospital-wide sessions and protocols.

Include Non-COVID-19 Teaching

While pandemic-specific education is necessary, it can be exhausting to focus both learning and teaching

around a single topic. Conversely, education about non-COVID-19 topics offers a mental break from the pandemic and likely improves overall patient safety. This demonstrates an important lesson for our trainees: pandemics distract immensely from care-as-usual, and we must stay mindful in our treatment of all patients.

Support Trainee Mental Health

Trainees, like all health care professionals, are susceptible to the mental toll of a pandemic.^{9,10} Acknowledging these effects and providing specific well-being resources for trainees can foster an environment that is safe, welcoming, and genuine. Chief residents are invaluable allies in cultivating available resources, and morning report is an ideal venue to promote them. We also incorporate brief reflection sessions (5 minutes or less) into our inpatient workflow and ensure that residents have time to attend longer well-being sessions. Though not uniquely useful during a pandemic, these strategies can maintain morale during a time of crisis and are a necessary adjunct to education.

Thankfully, Ontario saw its last confirmed SARS case in June 2003, but in its wake lay the delay of the national residency match, mass suspension of educational activities, and an exasperated trainee population.^{4,5} Though this prompted the creation of novel medical curricula, published accounts of innovations from either Canada or Asia are limited.^{11,12} It is clear that the COVID-19 pandemic will be longer-lasting; thus, it is incumbent on medical educators not only to adapt our teaching but also to study and optimize these innovations in the “new normal.” Available evidence suggests favorable educational outcomes utilizing online learning¹³; however, there is limited data on synchronous online teaching. Most internal medicine residency programs in the United States were not using this format prior to the COVID-19 pandemic,¹⁴ but we suspect that live video conferences are becoming ubiquitous.

As we have navigated the challenges posed to medical education by COVID-19 in Seattle, we appreciate the pivotal role of recording our experiences. We have chronicled, reflected on, and critically evaluated our curricular innovations, recognizing that changes may require revision as the pandemic waxes and wanes. While some adaptations have been accepted by our residents and fellows as adequate replacements for traditional educational activities, others have been welcomed as improvements to the status quo and should persist even after the pandemic recedes. Facing a larger-scale challenge than the 2003 SARS outbreak, we would be wise to view this

pandemic as an opportunity to trial new learning modalities and perhaps expand local curricula to the regional or even national level. Studying our interventions now will provide guidance during future outbreaks and help identify which innovations should be integrated into our standard teaching practices, thus paving the future path for GME.

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